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ABSTRACT

The mission of the Wisconsin Research and Development Center is to improve the quality of education by addressing the full range of issues and problems related to individualized schooling. Each major line of inquiry pursued is designed to culminate in the publication of a "milestone" document such as a book, a monograph, or conference proceedings. This collection of annotated bibliographies covers publications in the following areas: (1) studies of instructional programing for the individual student; (2) studies of administration and organization for instruction; (3) studies in language: reading and communication; (4) studies in mathematics; (5) studies of implementation of individualized schooling; and (6) evaluation of practices in individualized schooling. Also included are citations for technical, practical, theoretical, and working papers. (JD)

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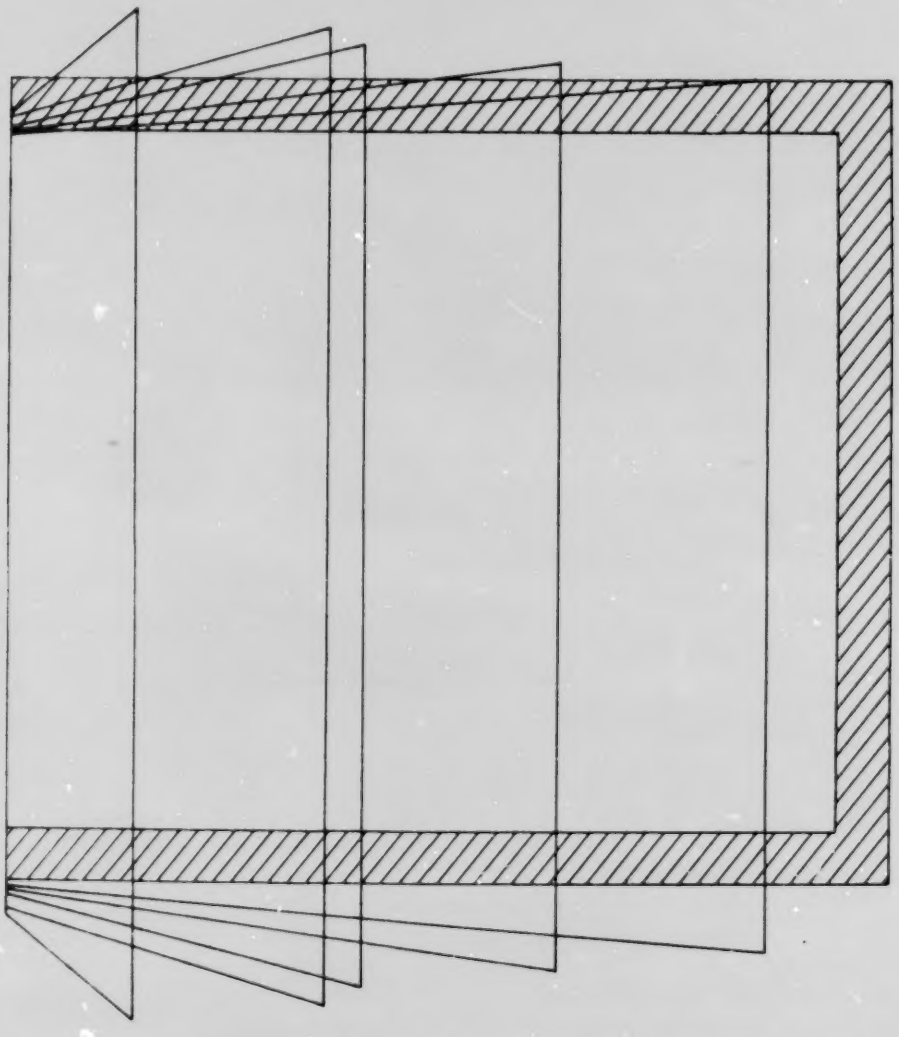
Bibliography of Publications

1980 Supplement



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Wisconsin Research and Development Center for Individualized Schooling

SP 017 207

BIBLIOGRAPHY OF PUBLICATIONS

1980 SUPPLEMENT

Wisconsin Research and Development Center

for Individualized Schooling

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Madison, Wisconsin

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MISSION STATEMENT

The mission of the Wisconsin Research and Development Center is to improve the quality of education by addressing the full range of issues and problems related to individualized schooling. Teaching, learning, and the problems of individualization are given concurrent attention in the Center's efforts to discover processes and develop strategies and materials for use in the schools. The Center pursues its mission by

- conducting and synthesizing research to clarify the processes of school-age children's learning and development
- conducting and synthesizing research to clarify effective approaches to teaching students basic skills and concepts
- developing and demonstrating improved instructional strategies, processes, and materials for students, teachers, and school administrators
- providing assistance to educators which helps transfer the outcomes of research and development to improved practice in local schools and teacher education institutions

The Wisconsin Research and Development Center is supported with funds from the National Institute of Education and the University of Wisconsin.

WISCONSIN RESEARCH AND DEVELOPMENT
CENTER FOR INDIVIDUALIZED SCHOOLING

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BOOKS

BOOKS

The Wisconsin Research and Development Center for Individualized Schooling has a responsibility to ensure that the knowledge gained from its research and development activities is readily available to the education community. For this reason each major line of inquiry pursued at the Center is designed to culminate in the publication of a "milestone" document such as a book, a monograph, or conference proceedings. The following books summarize and synthesize the work of Center-associated faculty and other scholars in several areas related to individualized schooling. Information regarding publication dates of books in press or in preparation may be obtained from the Center Information Office.

Allen, V. L. (Ed.). Children as teachers: Theory and research on tutoring. New York: Academic Press. 1976. 290 pp. $14.00.

These well-integrated articles discuss current theory and research on peer tutoring, an increasingly important technique in the education of children. Eminent scholars from several disciplines have contributed the original chapters that make up the book. The secondary themes of cross-age interaction and helping relationships among children are prominent throughout the book. With its emphasis on the practical educational and psychological aspects of peer tutoring, Children as Teachers will be of great benefit to educational psychologists, child psychologists, social psychologists, educators, learning researchers, school psychologists, curriculum developers, and to students and workers in special education, social work, and related disciplines.

The first two sections of the book establish the basic theoretical and empirical foundations for practical programs discussed in later sections. A wide range of theoretical perspectives is offered, including historical background, role theory, ethological and cross-cultural considerations, and social skills theory. Chapters in the second section present original research on social class and ethnic differences in tutoring by young children, teaching by siblings, nonverbal skills and consequences of tutoring for the tutor, and the use of a variety of nonprofessionals as helpers. The third section evaluates a wide range of tutoring programs currently operating in the schools. Authors of these chapters draw upon available research and their extensive practical experience to present the advantages and disadvantages of tutoring programs, and to discuss the important considerations that should be taken into account when developing tutoring programs in the school. Finally, two chapters of the book summarize an extensive amount of empirical research and practical experience relevant to tutoring programs in the school.

Allen, V. L., et al. Interpersonal skills in tutoring: The role of nonverbal behavior. New York: Academic Press. In press.

Tutoring by children is a very complex process consisting of task-oriented social interaction between the tutor and learner. Only a meager amount of attention has been paid to the interaction process itself, which seems to be one of the most important factors determining the outcome of tutoring programs. The purpose of the present book is to provide an in-depth analysis of the interactional skills used by children in a tutoring situation. Particular emphasis is placed on nonverbal behavior because of the subtlety and importance of this aspect of social interaction. There are no other books that address this specific topic.

The first major section of the book considers tutoring in a broad historical, sociological, and psychological context. The first chapter presents an historical overview and discusses the potential advantages and problems associated with tutoring programs from the perspective of the tutor, tutee, and society. The next two chapters discuss the theoretical models available for explaining interpersonal interaction, and present a detailed analysis of verbal and nonverbal components of interaction. The central portion of the book consists of a series of original studies conducted by the author and associates. These empirical studies focus upon various aspects of children's nonverbal behavior which are important in the tutoring situation. In each chapter that reports original research, an attempt is made to place the topic under discussion within a more general framework. This goal is accomplished in three ways: first, by providing a fairly lengthy review of the existing literature dealing with the problem; second, by presenting empirical studies in an abbreviated and readable form; and third, by including in each chapter a final section devoted to discussing results and pointing out concrete implications of the findings for tutoring programs. Role theory and social skills theory are taken as the conceptual framework for organizing and discussing the material presented in the book.

Dickson, W. P. (Ed.). Children's oral communication skills. New York: Academic Press. In press.

This book, which presents papers from a conference held in October 1978, integrates the research on children's communication skills deriving from two previously separate traditions: experimental research on referential communication skills and sociolinguistic research on children's communicative competence in natural settings. In addition, educational implications of the research and future directions for research and teaching of communication skills are considered.

The research brought together in this volume portrays an optimistic view of children's ability to communicate. Perhaps most exciting is the evidence emerging that children can be taught a number of speaking and listening skills. A second encouraging theme underlying the present volume is that both the referential and sociolinguistic traditions have important contributions to make to our understanding of children's communication. These two traditions have tended to remain isolated from each other; this book is a step toward the kind of cross-disciplinary interchange necessary for a full understanding of communication skills development. The third major contribution of this volume is to offer broader theoretical perspectives on children's communication skills. It contains theoretical papers which reflect the growing importance of cognitive models of the processes underlying children's communication performance.

This book is directed toward researchers in both the referential and sociolinguistic traditions, educators concerned with the development of a curriculum for oral communication skills, and policy makers concerned with the role of communication skills in the curriculum at the local, state, and national levels.

Klausmeier, H. J., & Allen, P. S. Cognitive development of children and youth: A longitudinal study. New York: Academic Press. 1978. 336 pp. $19.50.

The authors report the major findings from the first longitudinal study of cognitive development of children and youth, encompassing grades 1-12. This groundbreaking book presents a theory of cognitive learning and development (CLD theory) on which the longitudinal study is based, and describes the application of principles of cognitive learning and development to educational practices.

Psychologists, educators, and other professionals are given access to detailed longitudinal data on four different groups of students--Grades 1-3, 4-6, 7-9, and 10-12. Students' growth throughout the school year in acquiring concepts, understanding principles, understanding structures of knowledge, and problem solving is charted. Normative development is examined along with interindividual and intraindividual differences in the rate and pattern of development.

The authors present a design for instruction which evolved through two decades of research, together with a research-based form of schooling that makes possible effective instructional programming for the individual student. The results of many short-term experiments, the longitudinal study, and the school reform effort are brought together for the first time in this volume.

Klausmeier, H. J., & Associates. Cognitive learning and development: Piagetian and information-processing perspectives. Cambridge, Mass.: Ballinger Publishing Co. 1979. 384 pp. $25.00.

This book presents the results of a 4-year study of children's conceptual development from two perspectives: Klausmeier's conceptual learning and development (CLD) theory, which focuses on development during the school years, and Piaget's more comprehensive theory of cognitive development. The book makes significant progress in clarifying the relationships between the two theories and contributes substantially to extending knowledge of the course and nature of students' cognitive development. The material is addressed to the scholarly community in educational psychology, psychology, and education. It can also be used advantageously in graduate courses in cognitive development or learning.

Klausmeier, H. J., Rossmiller, R. A., & Saily, M. (Eds.). Individually guided elementary education: Concepts and practices. New York: Academic Press. 1977. 394 pp. $14.95.

Many elementary and middle schools across the country have adopted Individually Guided Education (IGE) in the last decade. Research and evaluation studies show that the teachers' own morale and the students' educational achievements are higher, and that the students' self-concept and attitudes toward learning are improved. This complete system for adapting instruction to meet the needs of individual children is a much-needed alternative to the age-graded, self-contained elementary school classroom, the departmentalized elementary school, and the unstructured, open classroom.

With Individually Guided Elementary Education: Concepts and Practices, students, teachers, and administrators now have an authoritative and comprehensive overview of this system. It is written by 16 scholars, most of whom worked with the Wisconsin Research and Development Center for Cognitive Learning, local schools, state education agencies, and teacher-education institutions in developing and refining IGE. It is ideal both for a basic text in a credit course or noncredit staff development program dealing with IGE, and also for a second text in courses and programs dealing with elementary and middle school education.

This book covers in detail the components of IGE, and also provides an overview and history of IGE. In addition, it defines objectives for starting IGE schools and establishing IGE as a focus for educational renewal, and guides readers to additional material with descriptions of a wide variety of print and audio-visual materials keyed to the chapters.

This book provides useful, how-to-do-it information for current and prospective teachers and administrators wishing to learn about IGE or adopt it for use in their schools. It will prove equally useful to the staffs of existing IGE schools in refining their practices. In addition to its value as a primary text for credit courses and noncredit staff development programs in IGE, it can serve as a second or supplementary text for courses and programs in particular aspects of individualization, such as individualized reading, mathematics, science, or social studies, and in courses on alternatives in education. Students, researchers, and teachers interested in curriculum and instruction, administration, or educational psychology at the elementary level will find the book's new perspectives and coverage invaluable for dealing with the reform and renewal of American education.

Klausmeier, H. J., & Sipple, T. S. Learning and teaching concepts: A strategy for testing applications of theory. New York: Academic Press. In press.

This book has three major themes. First, the authors report the results of 13 controlled experiments carried out over a 3-year period. These results markedly extend our knowledge about learning and teaching abstract process concepts (such as observing, inferring, predicting, and classifying) during the intermediate school years. Second, applications of Klausmeier's theory of cognitive learning and development and of his model of instructional programming for the individual student were tested and demonstrated; the book presents empirical verification of applications of both theories. The third substantive area of the book involves the research paradigm which had several noteworthy features. Each of the 13 experiments was carried out simultaneously, the cumulative effects of the experiments on both the experimental and comparison groups of students were measured, and the participating teachers carried out the experimental treatments as part of their regular instruction of the students.

An important feature of this project is developing and then empirically testing the effectiveness of instructional strategies and materials based on theory. This approach avoids the limitations of short-term experimentation that is unrelated either to theory or to instructional practice. It also eliminates the pitfalls of attempting to spell out applications of theory without conducting research on the applications. Thus, the book is of interest to practitioners as well as to researchers.

Levin, J. R., & Allen, V. L. (Eds.). Cognitive learning in children: Theories and strategies. New York: Academic Press. 1976. 314 pp. $17.50.

This book approaches children's learning in the classroom setting through a series of research projects carried out over a period of ten years by investigators at the Wisconsin Research and Development Center for Cognitive Learning. The research reported in the book stresses an orderly progression from basic to applied research in education and offers a balance of theoretical and practical information on learning and development in children. The chapters dealing with basic cognitive processes in children include discussions of research projects on concept development, memory processes, visual imagery, intellectual abilities, and metaphor. Strategies for improving classroom instruction in schools are dealt with through more applied research on prereading skills, creativity training, cross-age tutoring, and the teaching of concepts.

Lipham, J. M., & Daresh, J. C. (Eds.). Administrative and staff relationships in education: Research and practice in IGE schools. Madison: Wisconsin Research and Development Center for Individualized Schooling. 1979. 141 pp. $6.50.

This book synthesizes 20 studies, conducted between 1972 and 1978, that analyzed staff and administrative relationships in IGE schools. The book includes a brief description of IGE and its development, and major chapters on the adoption of IGE as an educational change, school organizational structure, educational leadership, and decision making. Both theoretical and practical applications of the research are discussed in detail, and areas for further research are indicated. Each study is abstracted in the appendix.

Many of the findings reported in the book have implications for educational practice. For instance, no innovation of any significance can occur in the school without the understanding and support of the principal and the active involvement of the staff. Strong linkage between teacher education institutions and local schools was also found to be an effective means for sustaining educational change. Also, principals and unit leaders must provide support, give direction, and encourage staff participation if the instructional program is to be effective. Different leadership behaviors are required during different stages of the implementation process. In addition, opportunities must be provided for the staff to participate appropriately in the decision-making process at both school-wide and instructional levels.

Massaro, D. W., Taylor, G. A., Venezky, R. L., Jastrzembski, J. E., & Lucas, P. A. Letter and word perception: Orthographic structure and visual processing in reading. New York: Elsevier-North Holland Publishing Co. In press.

This book evaluates how the reader's higher-order knowledge about orthographic structure interacts with featural information during the processing of letters and words. The research was carried out utilizing a general information processing model, which provided a formal framework from which hypotheses could be derived and tested. Since the study of visual processing in reading requires an examination of the visual features that are functional during reading, the authors describe those features used in the recognition of lowercase letters. In discussing the fundamental properties of the orthographic structure of English, they distinguish two broad categories of descriptions. The first is derived from statistical-redundance measures based on the frequency with which letter, letter sequences, and words occur in natural texts. The second category, rule-governed regularity, is based on phonological constraints of English and scribal conventions governing the spelling of English.

The psychological reality of various descriptions of orthographic structure in perceptual recognition tasks and overt judgment tasks are examined. The recognition tasks assess the degree to which knowledge of orthographic structure is utilized in word perception, and the overt judgment tasks assess the degree to which this knowledge is consciously available.

The book offers conclusions and implications for future research and classroom practice. For example, additional experiments might help researchers to choose between rule-governed regularity and statistical redundance. This research promises to lead to the description that best reflects the knowledge of orthographic structure used in the course of normal reading.

Arriving at a good description of orthographic structure should be beneficial in the development of reading instruction. Given that the utilization of orthographic structure is an important component in letter and word recognition, instructional materials should be designed to facilitate children's understanding of this structure. Current phonics programs address only the correspondences between spelling and sound, not the constraints in English orthography. Delineating the best description of orthographic structure might facilitate the teaching and learning of this structure.

Rossmiller, R. A., Geske, T. G., Frohreich, L. E., Doro, M., & Johnson, H. W. Research utilization and productivity in IGE schools. Madison: Wisconsin Research and Development Center for Individualized Schooling. 1979. 60 pp. $6.50.

This monograph summarizes the results of studies of cost, resource utilization, and productivity in elementary schools using the system of Individually Guided Education (IGE). Data for the studies were obtained from a random sample of 41 IGE schools and 15 matched pairs of IGE and non-IGE schools.

Instructional expenditures in IGE schools did not differ significantly from those in non-IGE schools. However, teachers in IGE schools spent their time differently than did their counterparts in non-IGE schools. IGE teachers devoted significantly more time to one-to-one instruction, particularly in reading and mathematics, and significantly less time to large group instruction.

A production function approach was used to identify the input and process variables that were most closely related to student achievement in reading and mathematics and to student self-concept. Several variables were found to be related consistently to student achievement in reading and mathematics. Among them were (a) teachers' involvement in a degree program, (b) years of teaching experience, (c) teachers' sex, (d) students' maturity, (e) students' social confidence, (f) teachers' perception of the principal's leadership, (g) teachers' expression of job satisfaction, and (h) teachers' involvement in decision making.

A set of 12 independent variables accounted for 78% of the variance in reading achievement and a similar set of 12 variables accounted for 71% of the variance in mathematics achievement. All of the variables included in the two composite sets were susceptible to control by teachers and administrators. One subscale of the Self-observation Scales, social confidence, served as a proxy for student self-concept. A set of 12 variables similar to those employed in the analyses of reading and mathematics achievement accounted for 72% of the variance in social confidence scores. The independent variables most closely related to social confidence tended to reflect the ambience of the school rather than specific aspects of the instructional process.

Yussen, S. R. (Ed.). The development of reflection. New York: Academic Press. In press.

This book results from a conference held in October 1979 to explore recent developments in two interrelated fields of inquiry, metacognitive development and interpersonal attribution. Metacognition is concerned with the knowledge or beliefs held by

individuals about the nature of some cognitive activity, e.g., remembering or comprehending. Interpersonal attribution concerns the beliefs held by individuals about what other people are like and what causes others to act the way they do.

The process of acquiring insights into one's own cognition is a logical part of acquiring understanding into the nature of what people are like in general. Thus, metacognitive awareness and interpersonal attribution appear to be closely linked.

The book consists of 10 chapters by the conference participants and brief introductory and concluding chapters by the editor. It defines the state of our knowledge about metacognitive growth and interpersonal attribution, speculates on the "link" between these two domains, and suggests consequences from this research for the practice of education. The book is expected to appeal to scholars in psychology, human development, and social psychology.

BOOKS IN PREPARATION

Allen, V. L., & Devin-Sheehan, L. The one-room school: A social-psychological analysis.

Harvey, J. G., & Romberg, T. A. (Eds.). Problem-solving studies in mathematics.

Popkewitz, T. S., & Tabachnick, B. R. (Eds.). The study of schooling: Field-based methodologies in educational research and evaluation.

Popkewitz, T. S., Tabachnick, B. R., & Wehlage, G. G. School reform and institutional life: A case study of Individually Guided Education.

Romberg, T. A., Carpenter, T. P., & Moser, J. M. (Eds.). Addition and subtraction: A developmental perspective.

STUDIES OF INSTRUCTIONAL PROGRAMMING FOR THE INDIVIDUAL STUDENT

LONGITUDINAL STUDY OF CHILDREN'S CONCEPTUAL DEVELOPMENT

Faculty Associate:

Herbert J. Klausmeier, Department of Educational Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Sipple, T. S., Allen, P. S., & Klausmeier, H. J. Supplementary tabular information to accompany the books by Klausmeier and Allen (1978), and Klausmeier and associates (1979). Technical Report No. 495. 67 pp. August 1979.

This report contains tabular information to supplement the books entitled, Cognitive Development of Children and Youth: A Longitudinal Study by H. J. Klausmeier and P. S. Allen (Academic Press, 1978) and Cognitive Development: Information-Processing and Piagetian Perspectives by H. J. Klausmeier and Associates (Ballinger, 1979). The introduction indicates the relevance of the tabular results in the technical report to the respective books. The various tables comprise the remainder of the report.

DEVELOPMENT OF METACOGNITION

Faculty Associate:

Steven R. Yussen, Department of Educational Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS, PRACTICAL PAPERS, AND WORKING PAPERS

Mathews, S. R., II., Nordahl, K. L., Levin, J. R., & Yussen, S. R. Consistency in children's picture classification. Working Paper No. 252. 22 pp. April 1979.

In two experiments, children were asked to sort sets of pictures which had been constructed to allow for placement into either taxonomic (semantic) or perceptual (physical) categories. In Experiment 1, 6-year-olds evidenced significant consistency in selecting either semantic or physical categories when sorting the two sets. In Experiment 2, both 4- and 7-year-old children also were consistent, with the younger children more frequently choosing a physical than a semantic basis for sorting, and the older children divided more evenly in whether they chose to sort semantically or physically. In both experiments, some children also failed to use either basis consistently. Taken together, the two experiments provide evidence for the short-term stability of a "spontaneous sorting preference." The potential consequences for information storage and retrieval are highlighted.

Yussen, S. R., & Berman, L. Consistency in the memory predictions of first, third, and fifth grade children. Technical Report No. 523. 27 pp. September 1979. ED 179 320.

Children from first, third, and fifth grade were given four different tasks which assessed their accuracy in predicting future memory. The major goal was to determine if there is cross task consistency in children's metamemorial insight. In addition, actual memory was assessed. Two of the tasks required recall; the remaining two required recognition. For each type, one version involved a word list, the other a sentence list. Contrary to expectation, there was little consistency across tasks in the accuracy with which children predicted recall. Age and type of task did not moderate the weak to modest correlations found. However, in other respects, the findings replicated the major results obtained in previous studies. For recall, children's prediction accuracy increased with age, but for recognition, there was little change. And for recall (but not for recognition), there was a strong relation between prediction accuracy and actual memory.

Yussen, S. R., Mathews, S. R., II., Buss, R. R., & Kane, P. Developmental change in judging important and critical elements of stories. Technical Report No. 524. 32 pp. October 1979. ED 178 900.

Two experiments were conducted to examine children's understanding (metacognitive awareness) that in a simple story, the following parts are most important or essential for comprehending it: what precipitates the character's action (Initiating Event), what the character did (Action), and what follows the character's action (Consequence). Children's judgments of simple stories revealed that second graders seldom selected this sequence, but that fourth, fifth, and sixth graders and adults did under a variety of conditions. In addition, individual differences in recall of the stories were predictable from older children's (fifth graders) judgments of the stories, but not from younger children's (second graders) judgments.

ANALYSIS OF CROSS-AGE TUTORING PROCESSES

Faculty Associate:

Vernon L. Allen, Department of Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Allen, V. L., & Plazewski, J. G. The role of visual and auditory cues in decoding comprehension. Technical Report No. 507. 24 pp. May 1979. ED 178 876.

Two competing hypotheses were tested concerning the relative importance of visual and auditory information in judging degree of comprehension of a stimulus child learning a lesson. Adult subjects estimated the student's level of comprehension from observing a videotape recording. Three experimental conditions were employed: (a) visual information only, (b) auditory information only, and (c) both visual and auditory information. The dependent variable was accuracy of the estimate of the student's comprehension, measured by the degree of agreement with the student's self-reported comprehension. Results showed that the greatest accuracy of decoding occurred in the visual-only condition, with the auditory-visual condition yielding significantly less accuracy, and with the lowest accuracy in the auditory-only condition.

Atkinson, M. L., Allen, V. L., & Ansusinha, P. Effects of training on accuracy of decoding complex nonverbal behavior. Working Paper No. 267. 48 pp. August 1979.

Two studies were conducted to investigate the effects of training on how accurately observers decoded a complex nonverbal stimulus. In the first experiment, observers viewed silent videotapes of school children listening to an easy or a difficult lesson. The stimulus children were either responding spontaneously or deliberately (role playing) and the observers made judgments about the type of behavior they had witnessed (spontaneous or deliberate, and easy or difficult). Some observers were given feedback about their decoding accuracy after each trial; others were given feedback plus an opportunity to discuss the decision among themselves; and a third group served as controls. Results showed that all observers demonstrated a consistent practice effect, but neither feedback nor feedback plus discussion improved decoding accuracy above the level of the control group.

In the second study the effect of practice alone (10 practice trials plus six test trials) was examined. Compared to a no-experience control group (who just decoded the six test trials), practice had no effect on decoding accuracy.

Brideau, L. B., & Allen, V. L. Multichannel communication: The impact of the paralinguistic channel on facial expression of emotion. Technical Report No. 500. 50 pp. March 1979. ED 180 047.

This study examines the impact of the paralinguistic channel on the ability to encode facial expressions of emotion. Subjects (encoders) were asked to encode facial expressions for five emotions (fear, sadness, anger, happiness, and disgust). The emotions were produced in three encoding conditions--facial channel alone, facial channel plus paralinguistics, and facial channel plus mouthing. Subjects (decoders) were shown silent videotapes of encoders' facial expressions. Decoders' accuracy in detecting the intended emotions was used as an index of communication accuracy. The results indicated that access to the paralinguistic channel had both facilitative and inhibitory effects on accuracy of communication by the facial channel. The direction of the effect was dependent on the emotion encoded. In addition, it was found that the impact of paralinguistics on the facial channel was due to the systematic face movements concomitant to talking rather than the production of appropriate vocal intonations. It was suggested that facial movements inhibit emotions expressed in the upper half of the face, but facilitate emotions expressed in the lower half of the face.

Plazewski, J. G., & Allen, V. L. The role of auditory feedback in the encoding of paralinguistic responses. Technical Report No. 514. 39 pp. August 1979. ED 178 875.

This study examines the role of auditory feedback in the encoding of paralinguistic affect by adults. A dependent measure was obtained by comparing the level of affect which encoders intended to produce with ratings of vocal intonations from adult judges. Five independent variables were manipulated: (a) presence versus absence of auditory feedback to the encoder from his or her own voice; (b) the literal content of the encoder's verbal message (positive/negative); (c) the encoder's intended level of vocal intonation (extremely unfriendly, moderately unfriendly, neutral, moderately friendly, extremely friendly); (d) the sex of the encoder (male/female); and (e) the sex of the decoder (male/female). Five hypotheses were tested. The hypothesis that absence of auditory feedback should yield lower encoding accuracy than presence of feedback was confirmed for friendly (but not unfriendly) tones of voice. The hypothesis that absence

of auditory feedback should yield a greater lowering (relative to presence of feedback) of accuracy of encoding inconsistent than consistent paralanguage was also confirmed for friendly (but not unfriendly) tones of voice. The hypothesis that absence of auditory feedback should yield a greater decrease (relative to presence of auditory feedback) of accuracy of encoding positive than negative paralinguistic inconsistency was confirmed. Contrary to prediction, females were more accurate encoders than males (but only for friendly tones of voice). Finally, the hypothesis that females should be more accurate decoders than males was confirmed (but only for the extremely unfriendly tone of voice).

ADAPTING INSTRUCTION TO STUDENT LEARNING STYLE

Faculty Associate:

Penelope L. Peterson, Department of Educational Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Peterson, P. L., & Janicki, T. Individual characteristics and children's learning in large-group and small-group approaches. Technical Report No. 496. 43 pp. April 1979. ED 176 884.

This study investigated aptitude-treatment interactions (ATI) in fourth-, fifth-, and sixth-grade students' learning in large- and small-group teaching approaches. Each of two elementary teachers taught a 2-week fractions unit to two classes of randomly assigned students. Each class received one approach. Students completed aptitude measures at the beginning of the study, and achievement, attitude, and retention measures at the end. Regression analyses showed significant ATI for preference for approach and for ability. Students who preferred small groups did worse in that approach than in the large-group approach. High ability students and low ability students did better and had more positive attitudes in the small-group and large-group approach, respectively. High ability students benefited by "teaching" their peers in the small group.

Peterson, P. L., Janicki, T. C., & Swing, S. R. Aptitude-treatment interaction effects of three teaching approaches: Lecture-recitation, inquiry, and public issues discussion. Technical Report No. 517. 45 pp. November 1979.

Study 1 investigated naturally occurring aptitude-treatment interactions (ATI) with three teaching approaches--lecture-recitation, inquiry, and public issues discussion. Study 2 attempted to replicate these ATI in a short-term study. Teachers taught social studies to ninth-grade students according to one approach. Students completed aptitude measures at the beginning of each study and achievement measures at the end. Results indicated that when an experimenter-constructed test was the outcome, the lecture-recitation approach was superior. But relative effectiveness of the approaches also depended on students' ability and level of conformance. When the measure of student performance was based on objectives of the approach, the results showed an ATI for ability x anxiety that was partially replicated across studies.

STUDENTS' COMMUNICATIVE COMPETENCE IN INSTRUCTIONAL CONTEXTS

Faculty Associate:

Louise Cherry Wilkinson, Department of Educational Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Cherry Wilkinson, L., Clevenger, M., & Dollaghan, C. A sociolinguistic approach to communication in small instructional groups. Technical Report No. 505. 89 pp. June 1979. ED 176 222.

The two purposes of this paper are: (a) to discuss a sociolinguistic approach to communication in the classroom; and (b) to provide an example of the use of this approach in the investigation of interaction among teachers and students in first-grade reading groups. A sociolinguistic approach to language is characterized by the study of communicative competence, the knowledge of language structure and function. A sociolinguistic analysis includes: (a) the study of meaning in context; (b) the accurate and complete sampling of speech events; and (c) the analysis of the samples of speech events which enable research questions to be addressed. The results of a study on communication in three first-grade reading groups are presented. The study focused on three types of requests: requests for attention, action, and information. Two research questions are addressed. The subjects were 15 first-grade students who comprised 3 separate reading groups, at the advanced level. Students' interactions in the all-student groups were audio- and videotape recorded during a reading activity. Requests for information and action/object were identified and further analyzed according to linguistic form. Data analysis revealed that children differed in the variety and complexity of their requests to other children, and no strong same-sex preference for choice of listener emerged.

Cherry Wilkinson, L., & Dollaghan, C. Peer communication in first grade reading groups. Working Paper No. 263. 32 pp. June 1979.

This study provides an analysis of two functions of language which school age children use in their communication with others: the request for information and the request for action and objects. The subjects for this study were 15 first grade students who comprised three separate reading groups. Students' interactions in an all-student (peer-directed) group were audio and video tape recorded during a reading activity. Requests for information and action/object were identified and analyzed according to

linguistic form. Children differ in the variety and complexity of their requests to other children, and different children evidenced a greater degree of communicative competence in comparison with other students. Individual differences are discussed.

INSTRUCTIONAL PROGRAMMING FOR THE INDIVIDUAL STUDENT IN SECONDARY SCHOOLS

Faculty Associate:

Herbert J. Klausmeier, Department of Educational Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS, PRACTICAL PAPERS, AND WORKING PAPERS

Daresh, J. C. Needs and specifications for materials in the Wisconsin program for the renewal and improvement of secondary education. Working Paper No. 271. 68 pp. October 1979.

Outlined in this working paper are the specifications for materials included as part of the Wisconsin Program for the Renewal and Improvement of Secondary Education. Part I is devoted to the technical and substantive specifications for audiovisual materials which include filmstrips with accompanying cassettes and supplementary audiocassettes without visuals. Part II presents specifications for printed materials which are comprised of a book on secondary education, two guides for school practitioners, and a guide for college instructors.

Daresh, J. C., & Klausmeier, H. J. A description of Cedarburg High School, 1977-78. Working Paper No. 255. 43 pp. April 1979.

In this working paper, the functioning of Cedarburg High School during the 1977-78 school year is described according to nine components: Administrative Arrangements, Organization for Instruction and Advisement, Curriculum, Instructional Programming for the Individual Student, Evaluation for Instructional Decision Making, Home-School-Community Relations, Community Learning and Work Experiences, Internal and External Supportive Arrangements, and Continuing Research and Development.

Klausmeier, H. J. Profiles of selected innovating secondary schools. Working Paper No. 259. 148 pp. April 197[illegible].

Principals and other persons of innovating middle schools, junior high schools, and senior high schools associated with the Wisconsin Research and Development Center for Individualized Schooling described the most interesting features of their schools and responded to a features checklist. They provided the names of contact persons in their schools and listed

materials explaining their programs' activities. The profiles were gathered and published as part of the activities of the Wisconsin Project on the Renewal and Improvement of Secondary Education. The background of the Wisconsin Project for the Renewal and Improvement of Secondary Education is provided. Included are comprehensive objectives that may be employed by a school to guide its renewal and improvement efforts. These objectives were used in developing the items of the checklist that was completed by each school.

Klausmeier, H. J., & Daresh, J. C. A description of Steuben Middle School, 1977-78. Working Paper No. 253. 31 pp. April 1979.

In this working paper, a detailed description of the functioning of Steuben Middle School, Milwaukee, Wisconsin, during the 1977-78 school year is presented. The school is described according to nine components: Administrative Arrangements, Organization for Instruction and Advisement, Curriculum, Instructional Programming for the Individual Student, Evaluation for Instructional Decision Making, Home-School-Community Relations, Community Learning and Work Experiences, Internal and External Supportive Arrangements, and Continuing Research and Development.

Klausmeier, H. J., & Daresh, J. C. A description of Hood River Valley High School, 1977-78. Working Paper No. 254. 45 pp. April 1979.

This working paper describes the functioning of Hood River Valley High School during the 1977-78 school year. The school is described according to nine components: Administrative Arrangements, Organization for Instruction and Advisement, Curriculum, Arranging Instruction for the Individual Student, Evaluation for Instructional Decision Making, Home-School-Community Relations, Community Learning and Work Experiences, Internal and External Supportive Arrangements, and Continuing Research and Development.

Klausmeier, H. J., & Daresh, J. C. A description of Webster Transition School, 1977-78. Working Paper No. 256. 37 pp. April 1979.

In this working paper, a detailed description of the functioning of Webster Transitional School, Cedarburg, Wisconsin, during the 1977-78 school year is presented. The school is described according to nine components: Administrative Arrangements, Organization for Instruction and Advisement, Curriculum, Instructional Programming for the Individual Student, Evaluation for Instructional Decision Making, Home-School-Community Relations, Community Learning and Work Experiences, Internal and External Supportive Arrangements, and Continuing Research and Development.

Klausmeier, H. J., & Daresh, J. C. A description of Carl Sandburg Junior High School, 1977-78. Working Paper No. 257. 37 pp. April 1979.

This working paper describes a detailed description of the functioning of Carl Sandburg Junior High School, Mundelein, Illinois. The school is described according to nine components: Administrative Arrangements, Organization for Instruction and Advisement, Curriculum, Instructional Programming for the Individual Student, Evaluation for Instructional Decision Making, Home-School-Community Relations, Community Learning and Work Experiences, Internal and External Supportive Arrangements, and Continuing Research and Development.

DEVELOPMENT OF COGNITIVE STYLE WITHIN THE AFRO-AMERICAN COMMUNITY

Faculty Associate:

Barbara J. Shade, Department of Afro-American Studies

TECHNICAL REPORTS, THEORETICAL PAPERS, PRACTICAL PAPERS, AND WORKING PAPERS

Shade, B. J. Racial preferences in psychological differentiation: An alternative explanation for group differences. Theoretical Paper No. 76. 34 pp. October 1979. ED 179 672.

Study after study has indicated some differences in the behavioral responses of Afro- and Euro-Americans. This has been particularly true in areas which are considered vital to successful participation in an "achieving" society. This paper proposes that these differences could be the result of culturally induced variations in the perceptual dimension of personality.

Examination of the research available in the areas of perceptual articulation, social perception, information processing, and environmental perceptions indicates the need to pursue this issue in greater detail. Attention should focus particularly on the influence of perception on Afro-American learning style.

STUDIES OF ADMINISTRATION AND ORGANIZATION FOR INSTRUCTION

ORGANIZATION OF THE SCHOOL FOR INDIVIDUALIZED INSTRUCTION

Faculty Associate:

James M. Lipham, Department of Educational Administration

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Brown Lehr, J. Staff development needs in middle and junior high schools that individualize instruction. Technical Report No. 519. (Ph.D. dissertation) 206 pp. June 1979. ED 179 513.

The purposes of this study were: (a) to identify the staff development topical needs of teachers engaged in individualizing schooling, (b) to identify the staff development strategies preferred by teachers engaged in individualizing schooling, and (c) to analyze the functional and dysfunctional aspects of strategies of staff development. In addition, the relationship of certain personal variables to staff development needs was explored and a total synthesis of a model staff development program was constructed. The study consisted of an intensive, in-depth analysis of 10 selected school staffs using survey field methodology techniques. Questionnaires and semi-structured interviews with both teachers and principals were used to collect the data.

The major conclusions concerning staff development needs in middle and junior high schools which individualize schooling were:

1. Respondents' identifications of needed inservice activities varied according to the individual differences between teachers and principals.
2. Teachers' preferences for the design of an inservice program varied according to individual differences.
3. Teacher motivation to participate in inservice activities resulted from a number of separate stimuli, financial aspects being the most important and multifaceted.

Speed, N. E. Decision participation and staff satisfaction in middle and junior high schools that individualize instruction. Technical Report No. 521. (Ph.D. dissertation) 228 pp. August 1979.

The major purposes of this study were: (a) to determine the congruence between perceived actual and desired frequency and extent of participation by teachers in the decision-making process; (b) to relate decision participation to teachers' job satisfaction;

(c) to relate selected personal and situational variables to decisional participation; and (d) to identify teachers' perceptions of who is and who should be involved in making selected educational decisions. Data were collected on-site in 10 middle and junior high schools located in seven different states, and included 242 teacher respondents.

Some major conclusions were:

1. The level of job satisfaction is directly proportional to the decisional condition of teachers.
2. Discrepancy measures between actual and desired decisional involvement explain more of the variance in job satisfaction than measures of actual involvement.
3. Most of the situational and personal variables examined do not have any significant relationship with the decisional condition of teachers.
4. Teachers want collegial decision-making groups at both technical and managerial levels to have more say in the decision-making process.
5. Teachers exhibit greater decisional deprivation in regard to managerial than in regard to technical level decisional issues.

STUDIES OF SCHOOL-COMMUNITY RELATIONS IN IGE SCHOOLS

Faculty Associate:

B. Dean Bowles, Department of Educational Administration

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Bowles, B. D., & Oinonen, C. School-community relations: A comprehensive bibliography. Theoretical Paper No. 78. 286 pp. October 1979. ED 177 737. $8.00.

Since 1973 the School-Community Relations Project at the Wisconsin Research and Development Center for Individualized Schooling has conducted research related to establishing school-community relations programs at the school site. In addition to several research reports, the project has produced a paper on school-community relations (1975), a casebook illustrating the place of school-community relations in the implementation of an educational innovation (IGE), and a series of practical materials to improve school-community relations. In connection with this research an extensive and wide-ranging collection of articles and books have been reviewed and developed into a bibliography by the project staff. The following range of topics has been covered: (a) school-community relations (general); (b) program, organization, and administration (change, innovation, assessment, and evaluation); (c) school-community relations activities (committees, elections-bonds-referenda, paraprofessionals, volunteers, aides, community resources, attitudes, and community education); (d) school-community relations processes (communication, involvement, participation, and conflict resolution); (e) specific publics (school boards and parents); (f) political aspects (politics of education and community power); (g) research; and (h) a bibliography of bibliographies. The bibliography is current to 1978 and many of the entries are annotated.

Karges, M. L., & Bowles, B. D. Community relations for schools. Practical Paper No. 21. 156 pp. December 1979. $4.75.

The purpose of this practical paper is to describe and illustrate the procedure for setting up a school-community relations program. The first chapter describes the following recommended components of such a program: (a) using a programmatic approach; (b) using the five school-community relations processes; and (c) designating the primary responsibilities for the program. The next four

chapters explain the procedure for implementing a program with these components. Each chapter includes a description of the goals, an explanation of the process, and a case study illustrating one step in setting up the program. By following the recommended sequence and suggestions, a school can establish an effective school-community relations program. This program should result in improved relations between the school and the community it serves.

Raskas, H. I. The relationship between school-community relations, community support, and student achievement in communities of different socio-economic character. Technical Report No. 525. (Ph.D. dissertation) 611 pp. in 2 parts. October 1979. ED 180 120.

This study examines the relationships between effective school-community relations, community support for schools, and student academic achievement in two communities of different socioeconomic character. The research was based on a programmatic model for school-community relations composed of three components: program elements, processes, and goals. The processes component provided five independent variables of communication, involvement, participation, resolution, and access. The variables of community support and student achievement were drawn from the goals component of the model. Community support for schools was the combination of the community's economic support and sense of legitimacy for the local neighborhood school.

Some conclusions were: (a) a clear difference was indicated between parents' involvement in school activities and their participation in the decision-making process, (b) most issues identified for resolution were at the individual child-parent-teacher level, (c) alternative models or paradigms to explain school-community relations were identified dependent upon a specific selected goal or outcome, and (d) the importance of conducting research at the local school site was indicated for the study of both school-community relations and the politics of education.

STUDIES IN LANGUAGE: READING AND COMMUNICATION

INFORMATION PROCESSING IN READING

Faculty Associate:

Dominic W. Massaro, Department of Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Massaro, D. W., & Taylor, G. A. Reading ability and the utilization of orthographic structure in reading. Technical Report No. 515. 62 pp. July 1979. ED 174 971.

Previous research has demonstrated that readers utilize orthographic structure in their perceptual recognition of letter strings. Two experiments were carried out to assess whether this utilization of orthographic structure varies with reading ability. Anagrams of words were made to create strings that orthogonally combined high and low single letter positional frequency and regular and irregular orthographic structure. These strings and the original words were used as test stimuli in a target search task in which subjects indicated whether or not a given target letter appeared in the test string. In the first experiment, good and poor college readers showed equally large effects of orthographic structure on task accuracy. In the second experiment, poor sixth-grade readers showed a smaller effect of orthographic structure than did average or good sixth-grade readers. College sophomores benefited more than orthographic structure than did the sixth graders. Post hoc correlations of measures of orthographic structure with reading ability revealed similar results. The utilization of orthographic structure appears to be an important skill in reading and differences in this skill might be partially responsible for differences in reading ability of relatively young readers. Although older readers appear to have mastered this skill, the cost of mastery may be partially responsible for deficits at other higher-order processing stages in reading. To facilitate the teaching of orthographic structure, some of the important constraints in written English and various games for teaching these constraints are presented.

PICTURES AND IMAGERY IN CHILDREN'S LANGUAGE-PROCESSING SITUATIONS

Faculty Associate:

Joel R. Levin, Department of Educational Psychology

TECHNICAL REPORTS, THEORETICAL PAPERS, PRACTICAL PAPERS, AND WORKING PAPERS

Levin, J. R. On functions of pictures in prose. Theoretical Paper No. 80. 53 pp. December 1979.

A conceptual framework is presented to permit a formal distinction among the several functions that prose-learning pictures likely serve. Two of these functions (the representation function and the transformation function) have proven useful in differentiating between the magnitude and consistency of picture effects that can be anticipated from one prose-learning study to the next. The "functional" analysis is also helpful in identifying both the kinds of variables that need to be controlled for when looking for pictures-in-prose effects, as well as the kind of research that still needs to be conducted to isolate the contributions of specific picture components.

Levin, J. R., Shriberg, L. K., Miller, G. E., McCormick, C. B., & Levin, B. B. A technique for improving students' memory for classroom material. Practical Paper No. 20. 15 pp. June 1979.

A general technique for improving memory is described. The method proved extremely effective when applied to elementary school children's learning of the U.S. capitals.

Levin, J. R., Shriberg, L. K., Miller, G. E., McCormick, C. B., & Levin, B. B. The keyword method as applied to elementary school children's social studies content. Working Paper No. 265. 28 pp. June 1979.

Twenty-two fourth- and fifth-grade children learned the states' capitals, according to either a mnemonic ("keyword") or a control procedure. A two-session crossover design was employed, with a 3-day interval between sessions. Even though the overall level of initial learning was quite high in both conditions, students learned more when applying the keyword method. Moreover, after

3 days, keyword students retained virtually all of what they had learned in the first session, whereas control students retained only about half. Research priorities and educational implications of the research are discussed.

McCormick, C. B., Levin, J. R., Pressley, M., & Shriberg, L. K. Assessing the classroom potential of the keyword method: A footnote. Working Paper No. 262. 19 pp. May 1979.

The keyword method of foreign vocabulary learning was successfully implemented in both small- and classroom-sized groups of fifth-grade students. The positive results are in contrast to those of previous research based on high school students. Consideration of the discrepancy is included in the discussion.

Miller, G. E., Levin, J. R., & Pressley, M. An adaptation of the keyword method to children's learning of foreign verbs. Working Paper No. 251. 27 pp. April 1979.

The keyword method of foreign vocabulary learning has been found to facilitate children's acquisition of concrete (imageable) nouns. In the present study, the method was adapted so as to be suitable for learning vocabulary items from another grammatical form class, namely action verbs. Older (fifth- and sixth-grade) and younger (first- and second-grade) elementary school children were randomly assigned to one of three keyword variations or to a no-strategy control condition. For children at both age levels, use of the keyword method facilitated performance, although consistent with previous research, age differences were found in the effectiveness of specific keyword method variations. In particular, learning was optimized for the younger children only when very explicit pictorial aids were provided. Possible future adaptations of the keyword method are also discussed.

Pressley, M., & Levin, J. R. Visual imagery strategies in children's associative learning: Evidence for a retrieval inefficiency. Working Paper No. 260. 29 pp. May 1979.

First and sixth graders were instructed to learn 18 paired associates. Children in the Imagery-Retrieval condition were instructed to construct interactive images during encoding and were instructed at testing to make use of the imaginal mediators. Imagery subjects were instructed to use an interactive imagery strategy during encoding, but were not reminded to use the mediators at testing. Control subjects were given no specific learning strategy instruction. Imagery-Retrieval first graders outperformed subjects in both the Imagery and Control conditions.

The performances by first graders in the Imagery and Control conditions did not differ significantly. Imagery-Retrieval and Imagery sixth graders remembered approximately the same number of pairs and remembered more than Control sixth graders. The results were interpreted within a developmental retrieval framework.

Pressley, M., Levin, J. R., Hall, J. W., & Miller, G. E. What makes the keyword method tick? An analysis of its components, with special attention to foreign word acquisition. Working Paper No. 249. 56 pp. March 1979.

The two major components of the keyword method of foreign vocabulary learning were isolated in three experiments. As was anticipated from a theoretical analysis of the method, the acoustic-link component affected primarily foreign word acquisition, whereas the imagery-link component affected primarily foreign word-English word associative connections. The keyword method proved superior to even the most challenging control condition when subjects had to produce English responses, given foreign equivalents. No negative effects of the keyword method were observed when subjects' cued acquisition of foreign words was assessed. A suggested modification of the current version of the keyword method, designed to increase foreign word acquisition, is included in the discussion.

Pressley, M., Levin, J. R., & Miller, G. E. Additional evidence concerning the effect of the keyword method on foreign word acquisition. Working Paper No. 266. 18 pp. June 1979.

Two experiments were conducted to assess the effect of Atkinson's keyword method of foreign vocabulary learning on foreign word acquisition. When combined with the results of a recent investigation, it appears safe to conclude that the keyword method facilitates learning in the foreign-English direction, with no negative consequences in the opposite direction. In fact, a trace of English-foreign facilitation was detected in one of the present experiments.

Pressley, M., Levin, J. R., Nakamura, G. V., Hope, D. J., Bispo, J. G., & Toye, A. R. The keyword method of foreign vocabulary learning: An investigation of its generalizability. Working Paper No. 270. 38 pp. October 1979.

Five experiments were conducted to examine some untested speculations about Atkinson's keyword method of foreign vocabulary learning. In a college population it was found that: (a) the method is equally effective for good and poor foreign vocabulary

items associated with more than one English meaning; (c) for vocabulary items with easy-to-generate keywords, it makes little difference whether the keywords are actually provided by the experimenter; and (d) providing keywords may result in increased incidental spelling errors on items for which keywords and corresponding foreign word syllables do not match exactly.

Shriberg, L. K., Levin, J. R., & McCormick, C. B. Learning about "famous" people via the keyword method. Working Paper No. 274. 28 pp. December 1979.

Eighth-grade students were presented fictitious passages containing the names and purported accomplishments of various individuals. In one condition (Pictures), students were shown illustrations in which a "keyword" (a word sounding like part of the person's name) was linked to the person's accomplishment. In the other condition (Pictures Plus), additional supporting details were included in the illustration. In comparison to control subjects, both keyword groups recalled substantially more accomplishments of the various people. Pictures Plus students also recalled more incidental information about the people. Moreover, students in both keyword conditions successfully applied the strategy when illustrations were no longer provided.

Steuck, K. W. The effects of pictures, imagery, and a change of context on young children's oral prose learning. Working Paper No. 264. (Master's thesis) 79 pp. May 1979.

Two experiments investigated the effects of the match or mismatch of the learning and testing contexts on young children's oral prose learning. In Experiment 1, 16 third grade students listened to two short, fictional narrative prose passages and were tested using a cued recall task 3 days later. Subjects tested in the context in which they learned, correctly answered more questions than those tested in a different context. In Experiment 2, 96 third grade students listened to the stories used in Experiment 1. One-third of the subjects viewed visual illustrations depicting the events and objects in the passages, one-third were given instructions to generate images of the passages, and the remaining third simply listened to the stories. Also investigated in Experiment 2 was the effect of the contexts. It was found that the match or mismatch did not affect performance on the cued recall task. However, visual illustrations in the form of simple line drawings facilitated learning, but the imagery instructions did not. Implications for future research were discussed.

Wasserman, B. L. Incomplete pictures and retarded children's oral prose learning. Working Paper No. 268. (Master's thesis) 77 pp. August 1979.

The present study probed further into the use and potential of incomplete pictures for enhancing recall of orally presented prose passages in an educable mentally retarded population. Seventy-two subjects, half reading at or above a third-grade level and half below, were randomly assigned in equal numbers to one of four conditions: control, imagery, and two incomplete-picture variations. No significant differences in story recall were observed among experimental conditions. The lack of an imagery effect replicates the results of a previous study using similar subjects. A significant correlation between mental age and performance was detected in the imagery condition.

ASSESSMENT AND ANALYSIS OF WORD IDENTIFICATION SKILLS IN READING

Faculty Associate:

Dale D. Johnson, Department of Curriculum and Instruction

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Baumann, J. F., & Wilson Schneider, K. Apprehension span of adult fluent readers: A clarification of J. M. Cattell's classic research on letter and word perception. Technical Report No. 520. 40 pp. September 1979. ED 178 877.

This study investigates the amount of print that can be apprehended in 40 millisecond tachistoscopic flash presentations. Strings of random letters, unrelated words, and words in context (sentences) served as test stimuli for 24 graduate students. Results indicated mean apprehension spans per flash of 3.7 letters for random letters, 9.3 letters (2.0 words) for unrelated words, and 11.5 letters (2.4 words) for words in context. These findings were consistent with Cattell's except that he reported a mean of "four words" for words in context. The authors stated that although context was not found to be as powerful a contributor to increasing apprehension span in limited-time reading at Cattell and others have reported, this does not necessarily negate the importance of context in normal reading. Results also indicated a strong positive correlation between the numbers of letters and words correctly and incorrectly identified. This was offered as support for the "risk taking" hypothesis: In an effort to make more correct identifications, better readers will also make more errors.

Johnson, D. D., Pittelman, S. D., Schwenker, J., & Shriberg, L. K. The assessment of structural analysis skills. Technical Report No. 526. 67 pp. December 1979.

The two studies highlighted in this report continue a line of research designed to (a) identify the subskills of word identification which correlate most highly with reading comprehension, and (b) develop empirically based instruments to assess these subskills. The issues discussed relate to the broad area of structural analysis, and concern assessment of skills in the subareas of inflected endings, possessives, and affixes.

In the first study, a prototype of the Inflected Endings Subtest was administered to 143 elementary school children in grades three and four. Results indicated that most students had mastered all of the inflected endings assessed, with the exception of the possessive use of the apostrophe.

In the second study, a prototype of the Affixes Test was administered to 275 children in grades four and five. Results of the Affixes study indicated that, while some of the 20 prefixes and suffixes assessed are fairly well known, others are still not understood by a majority of fourth and fifth grade students. In general, performance on prefixes was significantly greater than performance on suffixes. Overall, girls significantly outperformed boys, and fifth grade students achieved higher scores than fourth grade students.

Johnson, D. D., Shriberg, L. K., Pittelman, S. D., & Schwenker, J. A new approach to the assessment of phonics skills. Technical Report No. 532. 100 pp. December 1979.

The research discussed in this report continues an effort to identify subskills of word identification which correlate highly with reading comprehension and to develop empirically based instruments to assess these subskills.

A prototype of the Phonics Test was developed in winter 1977 and a revised version was administered in spring 1978. Analyses of the test data revealed several problems inherent in the instrument. Therefore, a new test was designed to meet these criteria. The new Phonics Test assesses 45 different spelling-to-sound correspondences in 141 items. The test is comprised of a Consonants Subtest and a Vowels Subtest.

The Consonants Subtest was administered to 187 third, fourth, and fifth grade students. A randomly selected subsample of students also participated in an oral reading task to establish concurrent validity for the new test. Results of this study indicated that by third grade, children have mastered most of the frequently occurring letter-sound correspondences in our language.

The Vowels Subtest was administered to 190 third, fourth, and fifth grade students. A randomly selected subsample of students also participated in an oral reading task. The results of the study indicated that, overall, performance was highest on vowel clusters, next highest on long vowels, and lowest on short vowels. The most interesting result of the study, however, was when children did make errors, they appeared to have been strategic in their responses.

Murphy, M. T. Anaphora: A cross disciplinary approach to research and theory. Technical Report No. 534. (Master's thesis) 100 pp. December 1979.

Anaphora is a linguistic structure, such as a pronoun, which refers to previously mentioned or implied text entities. Anaphora has been implicated as a possible cause of reading comprehension difficulty among children. Reading research has focused on the surface structures of anaphora (e.g., pronouns, noun demonstratives, etc.). Comprehension of anaphora has been viewed in reading research as a language learner's systematic acquisition of the various surface structures of anaphora. Such an analysis ignores the fact that anaphora is a complex relationship between an anaphoric structure and its antecedent. Research in cognitive science reveals that in comprehending anaphora, readers must bring a range of social, factual, and logical, as well as linguistic, knowledge to the page. Linguistic analysis of anaphora indicates that anaphora plays an important role in text by linking together the various parts of the text. The study of anaphora promises to provide information concerning the structure of texts and the psychological processes involved in text comprehension. This technical report reviews anaphora research from reading research, cognitive science, and linguistics. Recommendations for future investigations in reading research are offered.

Schwenker, J. Investigation of the contextual and word identification strategies of adult non-proficient readers. Technical Report No. 504. (Master's thesis) 111 pp. July 1979. ED 174 975.

The purposes of this study were to examine the feasibility of a modified cloze format in the assessment of contextual and structural analysis skills, and to examine certain factors of language processing among a population of adult, nonproficient readers. Subjects in the study were 69 adults enrolled in remedial reading courses at two technical colleges in Wisconsin. All subjects were administered either the Adult Basic Learning Exam (ABLE), Level III, or the Nelson-Denny Reading Test, Form C. Subjects were rank-ordered by reading percentile ranks, then successive matches of four were randomly assigned to four treatment conditions. Depending on the treatment condition, subjects were given skills training or no training, and were administered either the cued or uncued versions of the Contextual and Word Identification Measure (CWIM).

Results showed that the modified cloze format used in the CWIM was feasible for assessment of certain reading subskills. The value of subskill training was not established. Intraword cue information was found to be a significant factor affecting replacement scores, as was the location of the intraword cue,

with information in the initial position resulting in significantly higher replacement scores than information in the terminal portion of words. Form class identity of deletions was preserved in responses by a majority of subjects in all four treatment conditions across the four grammatical categories assessed in the study. Implications for future research using the CWIM format were discussed.

CHILDREN'S COMPREHENSION OF SYNTACTIC STRUCTURE

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TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Read, W. C., Schreiber, P. A., & Walia, J. Why short subjects are harder to find than long ones. Technical Report No. 527. (Revision of TR No. 466) 59 pp. December 1979.

This paper, a revised version of Technical Report No. 466, examines certain cues to surface constituency that are salient to children in the recognition of syntactic structure. Recognition is studied through a set of experiments requiring seven-year-old children to repeat certain syntactic constituents. These children can correctly identify subject and predicate phrases with surprising accuracy, but their performance appears to depend heavily on prosodic cues, as indicated by the poorer success of children in identifying single pronoun subjects and subjects of sentences with misleading intonation contours. It is argued that duration (phrase-final lengthening) is especially important in children's recognition of structure and that children may be more heavily dependent on prosodic signals of syntactic structure than are adults. Finally, it is suggested that children's reliance on prosodic cues may relate to the difficulty that many beginning readers have in comprehending what they read (even when they can identify the individual words in a written sentence) since prosodic cues are not systematically preserved in written language.

COMMUNICATION SKILLS STUDY

Faculty Associate:

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TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Dickson, W. P., Miyake, N., & Muto, T. Generalizability of encoding and decoding skills across two referential communication tasks. Working Paper No. 271. 35 pp. April 1979.

Research on individual differences in referential communication skill has been hindered by the fact that communication is by its nature dyadic. Two experimental techniques may be applied to this "two-body problem": one gains control by repeated pairings among individual speakers and listeners; the other gains control by holding messages constant. The present study used a multi-method-multitrait approach to examine the generalizability of the encoding and decoding skills of 16 college students within and between communication tasks. Two different referential communication tasks were used. The repeated pairing technique was used in a block assembly task in which students alternated as speakers and listeners, each student being paired with every other student. The technique of holding messages constant was used in a different task in which the same students encoded and decoded messages about a set of 16 abstract figures. Correlations among individual encoding and decoding scores on these two tasks revealed large significant correlations between encoding and decoding skills within each of the tasks. Although decoding skill correlated across the two tasks, encoding skill did not. Furthermore, decoding analytic descriptions was uncorrelated with decoding metaphoric descriptions. This study suggests that adults who are effective communicators in the encoding role tend to also be effective in the decoding role, at least within a specific communication task.

Dickson, W. P., & Patterson, J. H. Criteria for evaluating curriculum materials which use referential communication activities to teach speaking and listening skills. Working Paper No. 273. 71 pp. October 1979.

Recent attention to improving children's speaking and listening skills has resulted in the inclusion of oral communication in the Office of Education's definition of "basic skills". This

paper focuses on communication games and activities which can be used to teach these "informing" skills (also known as "referential communication skills"). The paper begins with a brief review of research on referential communication. A set of eight criteria are proposed for evaluating curriculum materials intended to teach speaking and listening. These criteria are applied to existing curriculum materials which make use of communication activities. In an effort to bridge the gap between research and practice, a number of communication games which have been used in referential communication research are examined. Application of the eight criteria to these research activities suggests that some of them have considerable potential as prototypes for curriculum materials. Future directions for the development of curriculum materials for teaching speaking and listening are suggested.

STUDIES RELATED TO OBJECTIVE-BASED READING INSTRUCTION

Faculty Associate:

Wayne Otto, Department of Curriculum and Instruction

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Harper, B. The construction of an instrument to measure elementary teachers' knowledge of a subskills approach to teaching reading. Technical Report No. 501. (Ph.D. dissertation) 191 pp. August 1979. ED 174 976.

This is a report of the procedures followed in constructing an instrument to assess elementary teachers' knowledge of a subskills approach to teaching reading. In the first phase of instrument development an outline of test content was developed, and was submitted to four reading authorities for evaluation. The second phase involved writing and selecting items for the preliminary test form. Based on the test outline, a pool of multiple choice items was generated and subsequently reviewed by persons knowledgeable in the subject matter area. The items were then revised or replaced, based on the reviewers' comments. The third phase of the test construction process involved: (a) field testing the preliminary test form with elementary teachers, (b) analyzing and revising the items based on the field tryout data, and (c) reassessing content validity of the revised instrument. In the final phase the revised instrument was subjected to a field tryout with 104 elementary teachers. The resulting data were examined to determine reliability and content validity of the present instrument. A review of the test development process indicated that the present instrument demonstrates content validity. This conclusion is based on cumulative evidence that content validity was built into the instrument from the beginning of the test development process by systematic, logical analysis for determining the adequacy of the items for measuring content in the test outline.

Kamm, K., & White, S. A description of the procedures used in implementing an objective-based reading program in four schools. Technical Report No. 503. 133 pp., July 1979. ED 177 474.

The members of the reading project staff at the Wisconsin R & D Center have had a continued interest in identifying both the problems and the successes elementary school personnel experience

in using an objective-based, or skill-centered, approach to reading instruction. Our experiences in developing the Wisconsin Design for Reading Skill Development, which provides a framework for using a skill-centered approach, have convinced us that skill-centered teaching is both workable and effective. The purpose of this study is to refine the current Wisconsin Design guidelines and to suggest general procedures for implementing any skill-centered approach to teaching reading.

On the basis of our observations in four schools we have identified a number of issues related to implementing such a skill-centered approach. In discussing the issues, we make recommendations as to how school personnel might resolve various conflicts as they arise. One of our salient conclusions is that the concerns of school personnel when they adopt an innovation are related as much or more to simply undergoing the process of change as to the specific guidelines for using the innovation. We strongly recommend that inservice training sessions be directed not only to the use of materials and proper procedures, but also to preparing teachers to make necessary changes in their personal teaching, testing, and group management styles.

Kuelthau Allen, K. The development of young children's metalinguistic understanding of "letter," "word," and "sentence." Technical Report No. 531. (Ph.D. dissertation) 282 pp. December 1979.

The purpose of this study was to examine the development of children's metalinguistic understanding of the basic unit in reading--the word. Metalinguistic understanding was defined in terms of two components of cognitive clarity: (a) the understanding of linguistic segments and (b) the comprehension of reading terminology.

The children's understanding of the word as a linguistic segment was measured by their ability to segment aural and visual sentences into words. The repeated measures segmentation task consisted of 11 test sentences which varied in sentence type and length. The sentences were composed of familiar words which varied in the number of syllables and in their visual configurations.

The children's understanding of reading terminology was measured by their proficiency on an explanation task and a recognition task involving the terms letter, word, and sentence.

It was concluded that developmental trends in children's metalinguistic awareness of the word can be described.

Morrison, B. The identification of reading skills essential for learning in seven content areas at postelementary levels. Technical Report No. 528. 81 pp. January 1980.

Reading educators have identified reading/learning skills that are necessary for vocabulary development and the comprehension of written materials, as well as the efficient use of study time and effort. A questionnaire was designed to give content area teachers an opportunity to review thirty-five of these reading/learning skills to indicate: 1) the relevancy of each skill for learning their subject matter, and 2) their expectations of a students' ability with that skill. This paper summarizes the responses of over four hundred postelementary teachers who completed that questionnaire. The respondents, all from the midwest, represented grades 7-12 in seven content areas: English, social studies, science, mathematics, home economics, business education, and industrial arts. The data, analyzed across and within content areas, indicate widespread recognition of the relevancy of the reading/learning skills as well as the expectation that students will need help in applying these skills to learn content. These results have implications for the development of preservice and inservice courses for teachers in all content areas at the secondary level.

Otto, W. R., White, S. R., & Camperell, K. Text comprehension research to classroom application: Developing an instructional procedure. Working Paper No. 275. 18 pp. December 1979.

The authors have been attempting to develop procedures for helping students not only to develop but also to apply specific comprehension skills when reading content-area materials. As the procedure has evolved they have become more aware of opportunities to augment their own intuitions and common sense observations from teachers with implications from existing research related to comprehension of text. In this paper they briefly describe the purpose and rationale for their developmental approach and show how they are attempting to bring research implications to bear on their work.

White, S. R., & Witte, P. L. Improving comprehension through repetition...repetition...repetition. Working Paper No. 276. 18 pp. December 1979.

Teachers are asking for specific suggestions to help students apply comprehension skills and read content material. The authors are investigating a mechanism to assist students in acquiring and applying specific comprehension skills as they read content texts. The mechanism is called marginal gloss because learning activities are placed in the margins of the text. Direction and support for developing marginal gloss have come from various

areas of related research. For the purpose of this paper, the authors focus on Smirnov's (1973) work in the area of memory development. Smirnov emphasizes that the active involvement of the learner and active, meaningful, and varied repetition are important in learning from text. He identifies five activities that he has found to be characteristic of effective learners: (a) developing a plan in which the material is divided into meaningful parts; (b) correlating new content with prior knowledge; (c) relating content from various parts of the text; (d) using imaging as a strategy for remembering; and (e) paraphrasing the content of texts in one's own words. Smirnov stresses that many students are not able to organize their activity or vary their repetition independently. Marginal gloss may provide a specific technique teachers can use to help students organize their learning and use positive repetition.

Witte, P. L., Morrison, B. S., & Otto, W. Reading instructions in postelementary schools: Review and comment. Technical Report No. 518. 76 pp. July 1979. ED 174 972.

This report summarizes the finding of a comprehensive review of the literature concerning reading instruction at the postelementary level. First, sources describing the perceived decline in reading achievement are summarized. Then literature describing postelementary reading programs and practices is reviewed. Evaluations of programs and suggestions for improving reading instruction at the postelementary level are included. Journals published by educators in reading and in the content areas of English, science, social studies, mathematics, and vocational-technical education as well as texts and published guidebooks related to reading program development were the source material for this report.

STUDIES IN MATHEMATICS

INTEGRATED STUDIES ON MATHEMATICAL SKILLS

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TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Carpenter, T. P. Cognitive development research and mathematics education. Theoretical Paper No. 73. 118 pp. May 1979. ED 178 328. $3.75.

The purpose of this paper is to identify how the theory and techniques of research in cognitive development can be applied to the study of learning and instruction in mathematics. Five basic research paradigms are characterized; and major directions of research on number, measurement, geometry, and adolescent reasoning are identified. Most of this research was built upon the work of Piaget and his associates. However, recently translated Soviet research and information processing techniques offer promising alternatives.

If cognitive development research is going to have a significant impact on education, its theories have to be recast into an educational context and principles of cognitive development have to be applied directly to educationally significant questions. The role of mathematics educators should not be to validate or develop aspects of different theories of cognitive development but to determine how useful these theories are in explaining childrens' learning of mathematics concepts. Specifically it is important to focus on content that is central to the mathematics curriculum. Furthermore, it is necessary to empirically establish how the descriptive information from research on childrens' thinking can be applied to prescribe instruction. One of the most promising directions for such research is to attempt to determine how content can be designed and sequenced to reflect or build upon childrens' informal mathematical concepts and strategies. A second potentially productive line of research is attempting to identify how instruction may be individualized to match childrens' level of development.

Carpenter, T. P., Hiebert, J., & Moser, J. M. The effect of problem structure on first-graders' initial solution processes for simple addition and subtraction problems. Technical Report No. 516. 73 pp. October 1979. ED 180 840. $3.00.

Forty-three first grade children who had received no formal instruction in addition and subtraction were individually administered 20 addition and subtraction problems. The problems were selected to represent the following semantic types: joining, separating, part-part-whole, comparison, and equalizing. Ten problems were presented physically using sets of concrete objects, and 10 corresponding problems were presented through verbal problem situations. Number triples for all problems were selected so that the sum of the two addends was between 10 and 17. For all problems physical objects were available to aid in the solution.

Contrary to previous analysis of children's solution processes for addition and subtraction problems, the results suggest that children do not transform problems so they can apply a single strategy. Rather they have a rich repertoire of strategies which they apply directly to a problem based on its semantic structure. These results also suggest that verbal problems may be an appropriate context to introduce addition and subtraction operations.

Carpenter, T. P., & Moser, J. M. An investigation of the learning of addition and subtraction. Theoretical Paper No. 79. 62 pp. November 1979. $3.25.

This paper describes the research program of the Mathematics Work Group of the Wisconsin Research and Development Center for Individualized Schooling. The major interest is in the development of children's abilities to solve verbal addition and subtraction problems and particularly in the processes and strategies used by children. Three factors are considered: (a) problem structure, (b) student characteristics, and (c) the nature of instruction.

An analysis of verbal problems is presented. This analysis includes a discussion of various types of problem entities: discrete sets, continuous attributes, and actions or transformations. Problem structure is also analyzed along three dimensions: action vs. static relationships, set inclusion, and order (larger vs. smaller). Examples of various problem types are given.

Results from the first year of an ongoing (1978-1981) longitudinal study of primary age students are included. These results are mainly gathered from individual problem-solving interviews with about 150 subjects. Various strategies employed and their change over time are examined.

The paper concludes with a discussion of the implications of the research, both present and contemplated, for instruction.

Hiebert, J. The effect of cognitive development on first grade children's ability to learn linear measurement concepts. Technical Report No. 506. (Ph.D. dissertation) 308 pp. June 1979. ED 178 361.

This study investigated the effect of several cognitive developmental capacities on first-grade children's ability to learn linear measurement. The cognitive capacities of interest were logical reasoning ability, as measured by Piagetian tasks of length conservation and transitivity, and information processing capacity, as measured by backward digit span.

Potential subjects were pretested on the cognitive tasks and on forms of the measurement tasks on which they would receive instruction. The final sample consisted of 32 children who evidenced no understanding of the measurement concepts, with eight children in each cell of a 2 x 2 matrix of high/low logical reasoning ability by high/low information processing capacity.

All subjects received similar instruction, in a one-to-one interview setting, on several basic concepts of linear measurement.

The results, with respect to logical reasoning ability, showed significant between-group differences on the measurement assessment tasks which were shown, a priori, to make substantial demands on these abilities. However, only the task involving the inverse relationship between unit number and unit size seemed to require these abilities. No significant differences were found between the high and low information processing groups and no interaction effects between the two developmental factors were reported.

Kouba, V. L., & Moser, J. M. Development and validation of curriculum units related to initial sentence writing. Technical Report No. 522. 492 pp. in 2 parts. October 1979. $10.50.

This paper reports the formative evaluation of six curriculum units related to initial sentence writing. These units are used as the instructional units for a coordinated study carried out by the Mathematics Work Group of the Wisconsin Research and Development Center for Individualized Schooling. The units were tried during the 1977-78 and 1978-79 school years at a single elementary school located in Madison, Wisconsin.

Information, including in-class observation, reports from teachers, pupil assessment, and notes from pupil comments, was gathered from trying the materials on about 50 children through their first and second years of elementary school.

The information is summarized by topic or unit and suggested revisions are stated. Copies of the newly developed units are contained in the Appendix to the report.

Moser, J. M. Young children's representation of addition and subtraction problems. Theoretical Paper No. 74. 44 pp. May 1979. ED 178 329. $2.50.

This paper presents a discussion of some variables associated with children's representation of certain addition and subtraction problems. Representation is defined as the change of modality of a problem component. The possible modalities that can be used in problem representation are physical, pictorial, sensual, verbal-spoken, verbal-written, symbolic, and internal.

Three components of addition or subtraction problems are identified. These are the two known numbers or measurable sets given, the relationship or action connecting the three numbers or sets of the problem, and the question or context that identifies the third missing number. These components are descriptive of the two major classes of addition and subtraction problems, namely symbolic and non-symbolic.

Non-symbolic problems can be further described along three major dimensions. These are whether or not there is a set-inclusion relationship among the three measurable entities of the problem, whether there is an active or static relationship, or whether the action or relationship is ordered in the sense of being incremental or decremental. A number of examples of problems fitting within the various dimensions are presented.

Finally, the so-called structure of problems is discussed, both from a mathematical and psychological point of view. It is argued that the psychological structure imposed by a child is a function of several variables, including problem type, number size, semantic considerations, amount and type of formal instruction received, and stage of cognitive development.

Romberg, T. A., Small, M., & Carnahan, R. Research on teaching from a curricular perspective. Theoretical Paper No. 81. 278 pp. in 2 parts. December 1979. $7.50.

The intent of this theoretical paper is to recast our ideas about teaching mathematics as a result of an extensive research review on teaching behaviors. The product of this review is an explanatory curricular model which takes into account the content being taught. The purpose of studying teaching from a curricular perspective and the constructs and experience which the literature review was based on is outlined in the initial chapter. The next

six chapters examine the contemporary literature with respect to some basic categories assumed to relate to teaching mathematics. These categories include: content, motivation, planning, classroom events, pupil outcomes and pursuits, and teacher and pupil background. Finally, in the concluding chapter we summarize the information and present a model based upon the review. The model of pedagogy presented in that last chapter should provide researchers a set of constructs which can be used to study the teaching of mathematics.

Weaver, J. F. Third grade students' performance on calculator and calculator-related tasks. Technical Report No. 498. 37 pp. July 1979. ED 176 992.

Explorations involving use of a simple algebra-logic calculator with no operational hierarchy (Texas Instruments model TI-1255) were conducted with a third-grade class approximately 25 minutes per week beginning late in the fall. Reported are findings from several tests administered to the third-grade pupils in conjunction with their calculator explorations during the second semester of the 1976-77 school year. Although calculators were judged to be helpful in working with exemplars of certain relationships and properties, calculator use in and of itself was not sufficient to generate high levels of comprehension of such properties and relationships.

OTHER ACTIVITIES

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TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Moser, J. M. The effect of calculator supplemented instruction upon the arithmetic achievement of second and third graders. Technical Report No. 502. 311 pp. September 1979. ED 180 764.

This study was an attempt to provide some evidence on the effects of calculator usage with primary age children. Specifically the study compared the performance of children who had access to calculators in specified instructional ways with children who did not have any access to calculators. Comparison was made on the performance on experimenter-made tests of arithmetic achievement in the areas of computation and place value.

Subjects consisted of children in two second- and two third-grade classes from two schools in Madison, Wisconsin. One class at each grade level was randomly designated as the experimental class and the other as the control. One school was implementing a "traditional" curriculum and the other was implementing the Developing Mathematical Processes (DMP) curriculum.

At the second-grade level, no statistically significant differences were noted between treatment groups except in the area of subtraction of 1-, 2-, and 3-digit numbers, where the experimental group did better. At the third-grade level, no statistically significant results were found except in the area of place value and division, where again the experimental groups did better. When the confidence level was extended to detect any trends in favor of one treatment group, results strongly suggested that the experimental groups at both schools performed at a higher level.

Moser, J. M., Moser, M. K., & Schall, W. E. Developing Mathematical Processes (DMP): User data report level 6. Working Paper No. 250. 142 pp. February 1979.

This report describes the user data for Developing Mathematical Processes (DMP), Level 6. These data were collected during the 1977-78 school year. Data were collected by means of four individual interviews conducted at regular intervals during the year. Teachers from schools located in Wisconsin and New York participated in the study. The data are divided into three categories. First, there are responses to specific questions posed on a written questionnaire that had four parts--individual teacher characteristics, DMP materials, assessment and record keeping, and management and use of the program. Second, teacher comments and reactions to various topics and activities in DMP Level 6 were collected in an unstructured manner. Thirdly, when available, records of children's levels of mastery on the regular objectives of the topics in DMP Level 6 were collected and are reported in this document.

Weaver, J. F., Blume, G. W., & Mitchell, C. E. Calculator explorations with seventh grade students: Some calculator-inspired instructional materials, observations, and investigations. Technical Report No. 497. 280 pp. July 1979.

This report brings together in a single source observations and materials of instructional importance in calculator explorations with seventh grade students from 1976 through 1978. Students used algebraic-logic calculators with no operational hierarchies. At the end of the school year, students were introduced to reverse Polish notation-based calculators.

STUDIES OF IMPLEMENTATION OF INDIVIDUALIZED SCHOOLING

STUDIES OF IMPLEMENTATION OF INDIVIDUALIZED SCHOOLING

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TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Barrows, L. K., Klenke, W. H., & Heffernan, J. J. The adoption of an innovation in schools. Technical Report No. 529. 250 pp. September 1979.

The Studies of Implementation is a 3-year longitudinal investigation of planned educational change. The Studies of Implementation work group is documenting and analyzing the innovative behavior of 13 elementary schools which have chosen the course of planned educational change. The instructional innovation all 13 schools have chosen to implement is the Instructional Programming Model (IPM). Ten of the schools have also adopted the organizational innovation, Individually Guided Education (IGE), of which the IPM is the central concept.

The purpose of this technical report is to present the first-year findings related to the question: What factors affect the decision to adopt an innovation (the IPM)? Chapter I presents an overview of the research and Chapter II presents a review of the literature related to the change process with special attention given to research on adoption. Chapter III describes the methodology used to study the adoption process in the research sites. Chapter IV presents the data in the form of vignettes which chronologically narrate the adoption process in each of the sites. In Chapter V, the data presented in the vignettes are analyzed and interpreted. Chapter V also contains conclusions about the adoption process and implications for continued research.

Davis, W. J., & Frank, F. The relationship between the perceived level of decisional participation of secondary school teachers and their job satisfaction: A discrepancy approach. Working Paper No. 272. 64 pp. November 1979.

The Studies of Implementation project focuses on the process by which an innovation becomes a pattern of individualized schooling. This study identifies those conditions that promote or retard change and relates them to the modifications they foster.

This working paper reports the results of a study of the relationship between the perceived level of participation and level of job satisfaction of secondary school teachers. The study provided an opportunity to pilot the decisional participation questionnaire which has since been adapted for use in the Studies of Implementation project. The study also allowed for a beginning exploration of the relationship between two potential key variables in the change process.

In investigating the relationship between decisional participation and job satisfaction among secondary school teachers, this study: (a) tested the Alutto-Belasco argument that an individual's desire for increased participation mediates this relationship; (b) tested the validity of the commonly used "summated" scoring procedure for measuring decisional participation; and (c) investigated the utility of defining decisional participation in terms of the frequency and extent of involvement.

Davis, W., Klenke, W., & Barrows, L. Foundations of the studies of implementation: The innovation and research sites. Technical Report No. 494. 149 pp. March 1979. ED 175 134.

In this report, we review some of the limitations of past studies on planned change and enumerate several criticisms that have been made against this body of knowledge. In an attempt to rectify these inadequacies, we propose a longitudinal paradigm to study this phenomenon.

The R & D Center's Studies of Implementation is projected as a 3- to 5-year study of 13 schools committed to implementing an innovative form of instruction. Each of the schools is being observed; both qualitative and quantitative data will be collected and analyzed over the life of the project.

Chapter I provides an introduction and background while Chapter II presents a brief rationale for selecting Individually Guided Education (IGE) and the Instructional Programming Model (IPM) as the primary foci of the Studies of Implementation. These innovations are described and the procedure used to measure the degree of implementation of the IPM is discussed. Chapter III sets the innovations in context by recording an historical account of the development and diffusion of IGE. Chapter IV presents a rationale for site selection procedure, specifies the sampling plan, and describes the sampling frame from which the sites were drawn. The sampling frame was composed of all the identifiable elementary schools which are members of Wisconsin IGE leagues (i.e., networks of IGE schools). Chapter V describes the 13 schools which have agreed to participate as research sites for the Studies of Implementation throughout the next 3 to 5 years.

Felker, R. M. The relationship between teacher implementation of an innovation and decisional participation in the elementary school. Technical Report No. 530. (Ph.D. dissertation) 274 pp. December 1979.

The major purpose of this research was to examine the relationship between teacher decisional participation and teacher implementation of the Instructional Programming Model (IPM) in Individually Guided Education (IGE) elementary schools. The conceptual and theoretical foundations of the study were based upon selected literature dealing with change theory and participative decision making.

Five hypotheses were developed to test the relationship of teacher decisional participation and teacher innovativeness. The Decisional Participation Inventory (DPI) was developed to measure issue importance, and actual and desired frequency, and extent of teacher decisional involvement. Teacher innovativeness was measured utilizing the Levels of Use of the Innovation (LoU) semi-structured interview technique. Data were gathered on site in ten elementary schools in the state of Wisconsin.

The distribution of the Levels of Use (LoU) data exhibited severely restricted variance which precluded further empirical testing of the change-participation hypotheses. However, a number of salient points were made regarding equilibrium change models, contextual and philosophical parameters of IGE, and the limitations of the positivist research paradigm.

Felker, R. M., & Davis, W. J. Change and participation: A review and critique of selected literature. Theoretical Paper No. 75. 48 pp. December 1979.

Subordinate decisional participation is a frequently cited and potentially key factor in the organizational change process. The exact nature and extent of the participation-change relationship, however, is a topic of some disagreement among reviewers and researchers in the education field. This paper presents an analysis of six major reviewers' seemingly contradictory interpretations of the participation-change relationship. It includes an in depth investigation of their literature bases, together with an explication of the methodological and theoretical frameworks which guided the research cited. The analysis provides an example of the complex issues which arise when the emphasis of research becomes one of proof or disproof rather than the integration of ideological positions into an overall conception of a social phenomenon. The paper concludes with some implications of this dilemma for future participation-change research.

Fruth, M. J., & Gardner, B. 1978 Urban conference report. Practical Paper No. 22. 302 pp. December 1979.

The proceedings of the 1978 Conference for Urban Educators, sponsored by the Wisconsin Research and Development Center, approach urban education from three different perspectives. In the first section are papers which describe basic issues in urban education: financial problems, legal mandates, cultural diversity, and desegregation. Papers in the second section examine the implications of these issues for instructional programming, teacher inservice, and citizen advocacy. In the last section educators describe successful programs used in urban schools. Included are the East Oak Cliff Subdistrict in Dallas, magnet schools in Buffalo and St. Louis, improvement of basic skills in Denver, and reorganization to improve student achievement in Oakland.

EVALUATION OF PRACTICES IN INDIVIDUALIZED SCHOOLING

PHASE I: LARGE SAMPLE BASIC STUDY

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TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Klopp, P. M., Buchanan, A. E., Stewart, D. M., & Romberg, T. A. Conduct of the study: Phase I of the IGE evaluation project. Working Paper No. 258. 215 pp. July 1979. ED 180 099.

Described in this paper are details of arrangements for Phase I of the Wisconsin Research and Development Center's IGE evaluation. The time period is from solicitation of participants (April 1977) through preparation of final data tapes for the structural equations analysis (September 1978). Topics include procedures for solicitation of participants, within-school arrangements for participation, materials and packaging, data collection procedures, and comments from participating schools.

Price, G. G., Janicki, T. C., Van Deventer, H. C., Jr., & Romberg, T. A. Organizational and instructional features that affect grade 2 and grade 5 reading achievement in IGE schools: A causal model analysis. Technical Report No. 510. 40 pp. April 1980.

This document provides a discussion of the relationships in IGE schools between the organizational and instructional features of schools and the reading achievement of second- and fifth-grade students. The theoretical positions that are part of the IGE model--some of them explicit and some of them implicit but evident--imply what some of the relationships should be. Thus, it was possible to form a theoretical model of how variations in different organizational and instructional features would be linked, and how, in turn, those variations would be linked to variations in achievement. This report presents that theoretical model and evaluates how adequately it fits data obtained from schools. The results of the causal analysis used suggest that the instructional and organizational features, as measured in this study, are not able to account for much of the variance associated with second- and fifth-grade reading achievement.

Price, G. G., Janicki, T. C., Van Deventer, H. C., Jr., & Romberg, T. A. Organizational and instructional features that affect grade 2 and grade 5 math achievement in IGE schools: A causal model analysis. Technical Report No. 511. 40 pp. April 1980.

This document provides a discussion of the relationships in IGE schools between the organizational and instructional features of schools and the math achievement of second- and fifth-grade students. The theoretical positions that are part of the IGE model--some of them explicit and some of them implicit but evident--imply what some of the relationships should be. Thus, it was possible to form a theoretical model of how variations in different organizational and instructional features would be linked, and how, in turn, those variations would be linked to variations in achievement. This report presents that theoretical model and evaluates how adequately it fits data obtained from schools. The results of the causal analysis used suggest that the instructional and organizational features, as measured in this study, are not able to account for much of the variance associated with second- and fifth-grade math achievement.

Price, G. G., Janicki, T. C., Van Deventer, H. C., Jr., & Romberg, T. A. Organizational features of IGE schools as correlates of teacher job satisfaction. Technical Report No. 512. 31 pp. November 1979.

This document discusses the relationships between organizational features of IGE, measured in the large sample survey phase of the IGE evaluation, and teacher job satisfaction. The theoretical model linking organizational features and teacher job satisfaction is tested using causal model analysis. Two findings were drawn from this analysis. First, teachers seem to gain satisfaction from a sense of participation in a larger movement, of having colleagues in other schools, and of sharing information with that broad audience. Second, teachers seem to gain satisfaction from a conviction that their educational program is an effective one.

Price, G. G., Van Deventer, H. C., Jr., Janicki, T. C., & Romberg, T. A. Procedures used in phase I of the IGE evaluation to scale, adjust, and aggregate reading and math achievement in grade 2. Technical Report No. 508. 37 pp. November 1979.

This technical report describes the procedures used in Phase I of the Individually Guided Education (IGE) evaluation to scale, adjust, and aggregate reading and mathematics achievement in grade 2. It includes an explanation of the administration procedures, a list of the tests administered to pupils, and a description of the adjustments made on individual student scores.

A discussion of how the achievement scores or students within a school were aggregated, and a description of the data are also included.

Price, G. G., Van Deventer, H. C., Jr., Janicki, T. C., & Romberg, T. A. Procedures used in phase I of the IGE evaluation to scale, adjust, and aggregate reading and math achievement in grade 5. Technical Report No. 509. 36 pp. November 1979.

This technical report describes the procedures used in Phase I of the Individually Guided Education (IGE) evaluation to scale, adjust, and aggregate reading and mathematics achievement in grade 5. It includes an explanation of the administration procedures, a list of the tests administered to pupils, and a description of the adjustments made on individual student scores. A discussion of how the achievement scores or students within a school were aggregated, and a description of the data are also included.

PHASE II: FOLLOW-UP AND EXTENSION STUDY

Faculty Associate:

Thomas A. Romberg, Department of Curriculum and Instruction

TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Ironside, R. A., & Conaway, L. IGE evaluation, phase II on-site validation and descriptive study: Final report. Technical Report No. 499. 267 pp. January 1979. ED 175 135.

This study is the second phase of the R & D Center's five-phase evaluation of IGE in elementary schools. Data for the year-long study were collected by professional staff of Research Triangle Institute under a subcontract with the Center. The purpose of Phase II was to study a nation-wide subsample of 30 Phase I schools in terms of: (a) validation and clarification of self-report data obtained in Phase I, (b) description of implementation history and utilization of network resources, (c) assessment of the feasibility of gathering specific IGE-related cost data, and (d) exploration of the dynamics of the implementation and refinement/renewal processes. A key feature of sample selection was inclusion of schools with higher and lower implementing status according to self-report data supplied in Phase I.

An extensive list of topics was developed, reviewed, and piloted to guide the field work in direct site-visit activities. Data were collected through observation, individual and group interviews, study of documents and materials, and attendance at meetings--with a focus on the school as a whole as well as the two units in which students had been tested in Phase I.

In the majority of schools, the Phase I self-report survey results were considered realistic, although the IGE Implementation Survey (77 items) was found to be tiring to some and posed difficulties for respondents in "part-IGE" schools. The existence, meaning, and use of specific school-wide instructional objectives were not obvious or consistent in many schools. Similarly, differences in understanding, valuing, and implementing IGE components were found across the 30 schools. While the multiunit organization is widely implemented and other components are inconsistently practiced, implementation of the Model for Instructional Programming for the Individual Student appears to remain at a relatively low level across this sample. It was also found that cost data were difficult to obtain in common form across all schools, particularly on a few weeks' notice.

PHASE III: REFORM/RENEWAL IMPACT OF IGE

Faculty Associates:

Thomas S. Popkewitz, Department of Curriculum and Instruction
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B. Robert Tabachnick, Department of Curriculum and Instruction
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TECHNICAL REPORTS, THEORETICAL PAPERS,
PRACTICAL PAPERS, AND WORKING PAPERS

Landsness, R. M. Sample selection for phase III of the IGE evaluation project. Working Paper No. 269. 25 pp. November 1979.

In 1976, the University of Wisconsin Research and Development Center decided to conduct a nationwide study of its system of Individually Guided Education (IGE). This paper briefly describes Phase III of this project, and the specific procedures and strategies used in the Phase III sample selection process.

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No. 499 Ironside, R. A., & Conaway, L. IGE evaluation, phase II on-site validation and descriptive study: Final report. Technical Report No. 499. 267 pp. January 1979. ED 175 135.

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No. 511 Price, G. G., Janicki, T. C., Van Deventer, H. C., Jr., & Romberg, T. A. Organizational and instructional features that affect grade 2 and grade 5 math achievement in IGE schools: A causal model analysis. Technical Report No. 511. 40 pp. April 1980.

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